

Message Text

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FOR SSM ONLY

E.O. 11652: N/A
TAGS: OGEN
SUBJ: PROBLEMS WITH PIRCS SYSTEM

SUMMARY: THIS MESSAGE DESCRIBES IN DETAIL PROBLEMS EXPERIENCED WITH THE PIRCS SYSTEM AND RAISES QUESTIONS CONCERNING ITS SUITABILITY FOR CONTINUED OPERATIONAL USE AT SFM. THE CONTENTS OF THIS MESSAGE AND DECISIONS ON THE FUTURE OF THE SYSTEM WILL BE DISCUSSED WITH MR. KONTOS AND MR. WALLEN DURING THEIR FORTH-COMING VISIT TO THE SINAI.

1. SFM FIRST INSTALLED THE PIRCS SYSTEM IN JULY OF 1976. THE SYSTEM HAS REMAINED OPERATIONAL FOR APPROXIMATELY 2 1/2 MONTHS OUT OF THE 14 MONTHS ELAPSED SINCE THEN. PARTIAL OPERATION HAS BEEN ACHIEVED FOR APPROXIMATELY 3 OF THOSE FOURTEEN MONTHS AND WAS TOTALLY INOPERATIVE OR UNAVAILABLE FOR THE REMAINING 8 1/2 MONTHS.

2. THE FOLLOWING FAILURES/REPAIRS HAVE BEEN ENCOUNTERED:

A. THE THERMISTER COOLING UNIT ON THE B SENSOR/TRANSMITTER UNIT APPEARS TO HAVE FAILED AS EVIDENCED BY LOW RESISTANCE READING IN ACCORDANCE WITH PARA 4.8A, PAGE 4-23B OF THE MANUAL.

B. POTENTIOMETERS UTILIZED FOR ALIGNMENT HAVE WORN TO POINT THEY NEED REPLACEMENT. THEY ARE R63 AND R66 ON THE X5000532
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PAGE 02 SINAI 01741 161423Z

DEMULPLEXER AND DISPLAY PROCESSOR CIRCUIT BOARD IN THE MONITOR RECEIVER. THESE BOARDS ARE ILLUSTRATED ON PAGES 5-40 AND 5-39 IN THE MANUAL. THE ALIGNMENT IS DESCRIBED IN PARAGRAPH 4.15.3 AND 4.14 RESPECTIVELY. THE READINGS AND ADJUSTMENTS ARE UNSTABLE APPARENTLY DUE TO REPEATED ALIGNMENT TO APPROXIMATELY THE SAME POINT ON THE CONTROL. THESE PARTS WERE NOT SUPPLIED AND ATTEMPTS

TO OBTAIN THEM LOCALLY HAVE FAILED.

C. MEASUREMENT OF THE HORIZONTAL SWEEP WAVEFORMS AT TEST POINT 43 ON THE 3001676-1 POWER SUPPLY CIRCUIT BOARD IN THE SENSOR/ TRANSMITTER WERE NOT THE SAME FOR UNITS A AND B. SINCE A WAS FUNCTIONING BETTER THAN B, THE U4 AMPLIFIER HAS BEEN CHANGED TWICE IN UNIT B WITH NO CHANGE IN THE WAVEFORMS ON B. IT IS SUSPECTED THAT THE INTEGRATED CIRCUITS SUPPLIED AS DIRECT SUBSTITUTION FOR THE U4 PART IN THE UNIT MAY HAVE A MINOR VARIATION THAT IMPAIRS ITS USAGE. THIS IS NOT CERTAIN SINCE THE MANUAL CONTAINS NO WAVEFORM DIAGRAMS.

D. THE ADJUSTMENTS AS DESCRIBED IN PARAGRAPHS 4.15.4 AND 4.15.5 ARE NOT POSSIBLE FOR AN AS YET UNDETERMINED REASON. IT IS SUSPECTED THAT THERE IS FAILED CIRCUITRY IN THE DEMULTIPLEXER AND DISPLAY PROCESSOR CIRCUIT BOARD THAT CAUSES AN INTER-ACTION IN THE CONTROLS SINCE EITHER SENSOR TRANSMITTER MARKER MAY BE ADJUSTED BUT ADJUSTMENT OF THE OTHER CAUSES THE FIRST TO DRIFT. THE PROBLEM WILL BE EXAMINED FURTHER.

3. THE FOLLOWING DOCUMENTATION PROBLEMS HAVE BEEN ENCOUNTERED:

A. THE MANUAL DISCUSSES THE EQUIPMENT ON A BLOCK DIAGRAM LEVEL WHILE THE REPAIR OF THE EQUIPMENT IS BEING ATTEMPTED TO THE COMPONENT LEVEL.

B. NO WAVEFORMS ARE ILLUSTRATED FOR COMPARISON TO THOSE OBSERVED. THE RESULT IS THAT WAVEFORM ANALYSIS IS LIMITED TO WHAT MAY BE DEDUCED FROM DETAILED CIRCUIT ANALYSIS OR BY COMPARING SENSOR/TRANSMITTER A TO WAVEFORMS FOR SENSOR/ TRANSMITTER B, NEITHER OF WHICH IS PERFORMING WELL.
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PAGE 03 SINAI 01741 161423Z

C. THE DRAWINGS DO NOT REFLECT HARDWARE STATUS. R39 ON THE MONITOR RECEIVER CONTROL CIRCUIT BOARD IS SHOWN AS A 200K POTENTIOMETER ON THE X5000519 CIRCUIT BOARD SCHEMATIC DRAWING WHILE A 500K POTENTIOMETER IS INSTALLED IN THE UNIT. THE X5000528 SCHEMATIC FOR THE MONITOR RECEIVER DEMULTIPLEXER AND DISPLAY PROCESSOR BOARD SHOWS NO U1 NOR U3 WHILE THE X5000532 CIRCUIT BOARD ASSEMBLY DRAWING SHOWS BOTH. THE ALIGNMENT PROCEDURE, PARA. 4.15.3, STEP 3 ON PAGE 4-34 CALLS FOR A MEASUREMENT ON PIN 6 OF U3. IT IS SUSPECTED THAT THE INTEGRATED CIRCUIT SHOWN AS U3 ON THE SCHEMATIC IS INSTALLED IN THE SOCKET SHOWN AS U2 ON THE ASSEMBLY DRAWING. A SIMILAR SITUATION EXISTS WITH R7 VERSUS R11. IT IS SUSPECTED THAT R7 IS INSTALLED IN THE POSITION SHOWN FOR R11 AND THAT THE PROCEDURE DID NOT GET CHANGED AFTER A DESIGN CHANGE. CONFIRMATION OF THESE SUSPICIONS WOULD BE BENEFICIAL.

4. THE CURRENT STATUS OF THE PIRCS IS AS FOLLOWS:

A. SENSOR/TRANSMITTER B IS INOPERABLE.

B. SENSOR/TRANSMITTER A IS FUNCTIONAL BUT THE OPERATIONS ARE DEGRADED.

C. PARTS HAVE BEEN ORDERED FROM CONUS TO SOLVE SOME OF THE

PROBLEMS TO A POINT WHERE THE REST MAY BE INVESTIGATED.

D. THE SYSTEM IS TO BE DEPLOYED WITH SENSOR TRANSMITTER B OMITTED UNTIL SENSOR/TRANSMITTER A OPERATION IS NO LONGER POSSIBLE OR REQUISITIONED PARTS ARRIVE TO ALLOW FURTHER TROUBLESHOOTING.

5. SFM'S EXPERIENCE WITH PIRCS SYSTEM RAISES QUESTIONS AS TO ITS SUITABILITY FOR DEPLOYMENT IN THIS SITUATION. THE EQUIPMENT AND THE SUPPORTING DOCUMENTATION IS OF A PROTOTYPE NATURE AND, AS IS NORMAL FOR A PROTOTYPE SITUATION, HAS NOT BEEN ADVANCED TO PRODUCTION STANDARDS. ALSO NORMAL IN PROTOTYPE SITUATIONS IS THE ABSENCE OF SUPPORTING SPARES. THE SPARES SITUATION IS AGGRAVATED BY THE FACT THAT THE COMPONENTS ARE, FOR THE MOST PART, NOT AVAILABLE LOCALLY, AND TOO NUMEROUS TO STOCK INDIVIDUALLY. ALTHOUGH THESE PROBLEMS CAN BE OVERCOME, THE LIMITED OFFICIAL USE

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PAGE 04 SINAI 01741 161423Z

EXPENDITURE IN TIME, EFFORT AND MONEY MAY NOT JUSTIFY THE INCREASED CAPABILITY WE SEEK. WE WILL WISH TO DISCUSS THIS WITH MR. KONTOS AND MR. WALLEN DURING THEIR FORTHCOMING VISIT TO SFM. HUNT

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